**What are variables?**

When you do an investigation there are usually many factors to consider

which may affect your results. These factors are called variables. Some

examples are time, distance, speed, weight, mass, different metals or acids.

In science you need to make sure that your investigation looks at just two

variables at a time, so you can see how they affect each other. Below are five

steps to help you decide what variables you are going to work with in an

investigation.

**1 )Name all the variables**

Imagine you decided to investigate shoe soles and friction. What are all the

variables that might affect the friction of shoe soles? They are:

weight of the shoe the type of surface the shoe is in contact with

surface area of the shoe the lubricant, such as water, between the sole and

the slope the shoe is on the surface

\_ the force with which you pull the shoe.

**2) Decide what you are going to investigate**

The next thing is to decide which of these variables you are going to

investigate. You need to choose just two variables.

For example, you could look at how the weight of the shoe affects the force

you pull it with to make it move.

**3) Decide what you are going to change**

Now you need to decide which of the two variables you are going to

change. This is the input variable (or independent variable).

In the example, you would choose to change the weight of the shoe by

putting weights in it, such as 100 g, 200 g, 300 g, etc.

**4) Decide what you are going to measure**

The other variable is the one you are going to measure. This is the outcome

variable (or dependent variable).

In the example, you would measure the force you need to pull the shoe

with at each weight, using a forcemeter.

**5) Decide what you are going to keep the same**

Finally, you need to keep all the other variables the same if you can, to make

sure the investigation is a fair test. This means that you need to decide on

values for all them.

In the example, you would need to use the same surface all the time, the

same slope and not introduce any lubricant such as water. You need to

include these values in your plan.